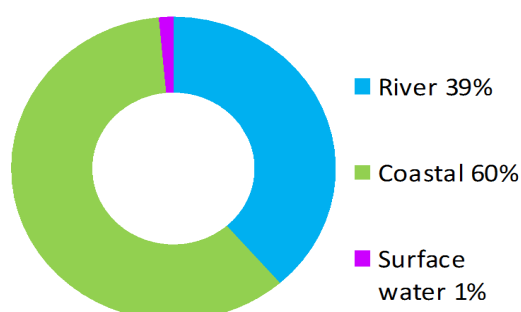


## Creetown (Potentially Vulnerable Area 14/17)

| Local Plan District | Local authority               | Main catchment |
|---------------------|-------------------------------|----------------|
| Solway              | Dumfries and Galloway Council | Moneypool Burn |

### Summary of flooding impacts



#### At risk of flooding

- 90 residential properties
- 20 non-residential properties
- £340,000 Annual Average Damages

(damages by flood source shown left)

Summary of flooding impacts

### Summary of objectives to manage flooding

Objectives have been set by SEPA and agreed with flood risk management authorities. These are the aims for managing local flood risk. The objectives have been grouped in three main ways: by reducing risk, avoiding increasing risk or accepting risk by maintaining current levels of management.

Many organisations, such as Scottish Water and energy companies, actively maintain and manage their own assets including their risk from flooding. Where known, these actions are described here. Scottish Natural Heritage and Historic Environment Scotland work with site owners to manage flooding where appropriate at designated environmental and/or cultural heritage sites. These actions are not detailed further in the Flood Risk Management Strategies.

Objectives

### Summary of actions to manage flooding

The actions below have been selected to manage flood risk.

| <i>Flood protection scheme/works</i> | <i>Natural flood management works</i> | <i>New flood warning</i> | <i>Community flood action groups</i> | <i>Property level protection scheme</i> | <i>Site protection plans</i> |
|--------------------------------------|---------------------------------------|--------------------------|--------------------------------------|---|------------------------------|
| Flood protection study               | <i>Natural flood management study</i> | Maintain flood warning   | Awareness raising                    | <i>Surface water plan/study</i>         | Emergency plans/response     |
| Maintain flood protection scheme     | Strategic mapping and modelling       | Flood forecasting        | Self help                            | Maintenance                             | Planning policies            |

Actions

## Creetown (Potentially Vulnerable Area 14/17)

| Local Plan District | Local authority               | Main catchment |
|---------------------|-------------------------------|----------------|
| Solway              | Dumfries and Galloway Council | Moneypool Burn |

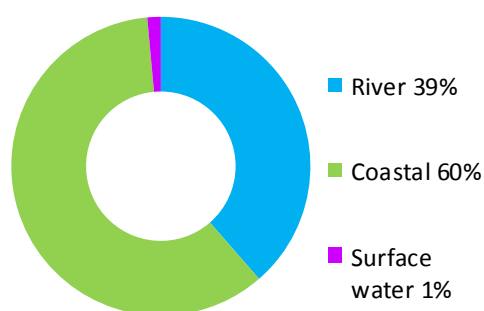
### Background

This Potentially Vulnerable Area is located in the west of the Solway Local Plan District and incorporates the town of Creetown (shown below). It is approximately 30km<sup>2</sup>.



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There are approximately 90 residential properties and 20 non-residential properties at risk of flooding. The Annual Average Damages are approximately £340,000.



**Figure 1:** Annual Average Damages by flood source

### Summary of flooding impacts

There is a risk of coastal flooding in the south west of the area where the Balloch Burn and the Moneypool Burn converge to form the Ferry Burn in Creetown. The Ferry Burn subsequently discharges to the River Cree, which is tidal at this location. Coastal flooding is predicted to affect a number of residential and non-residential in the vicinity of Mill Street, Harbour Street, Norris Street and Silver Street.

River flooding is mostly attributed to the Moneypool Burn and the Balloch Burn. In rural reaches of these watercourses flooding is restricted to a relatively narrow corridor of mainly agricultural land or woodland and a 1km stretch of Chain Road. Within the lower reaches in the urban area of Creetown, a number of residential and non-residential properties are at risk of river flooding.

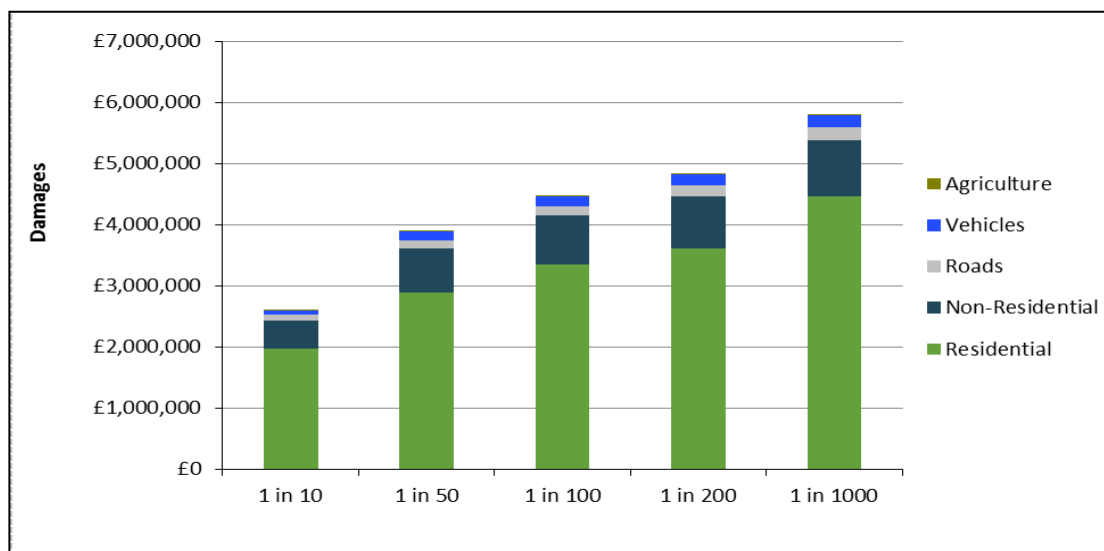
Within this Potentially Vulnerable Area it is estimated that climate change will increase the number of residential properties at risk of flooding from approximately 90 to 130 and the number of non-residential properties from approximately 20 to 30.

The risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is summarised in Table 1. The figure shows almost all impacts are predicted in Creetown. People, non-residential properties and roads are shown to be at risk.

The damages associated with floods of different likelihood are shown in Figure 2. Residential properties affected by coastal and river flooding experience the highest economic impact at approximately 80% of the damages. Non-residential properties also provide a notable portion of the damages. The location of the impacts of flooding is shown in Figure 3.

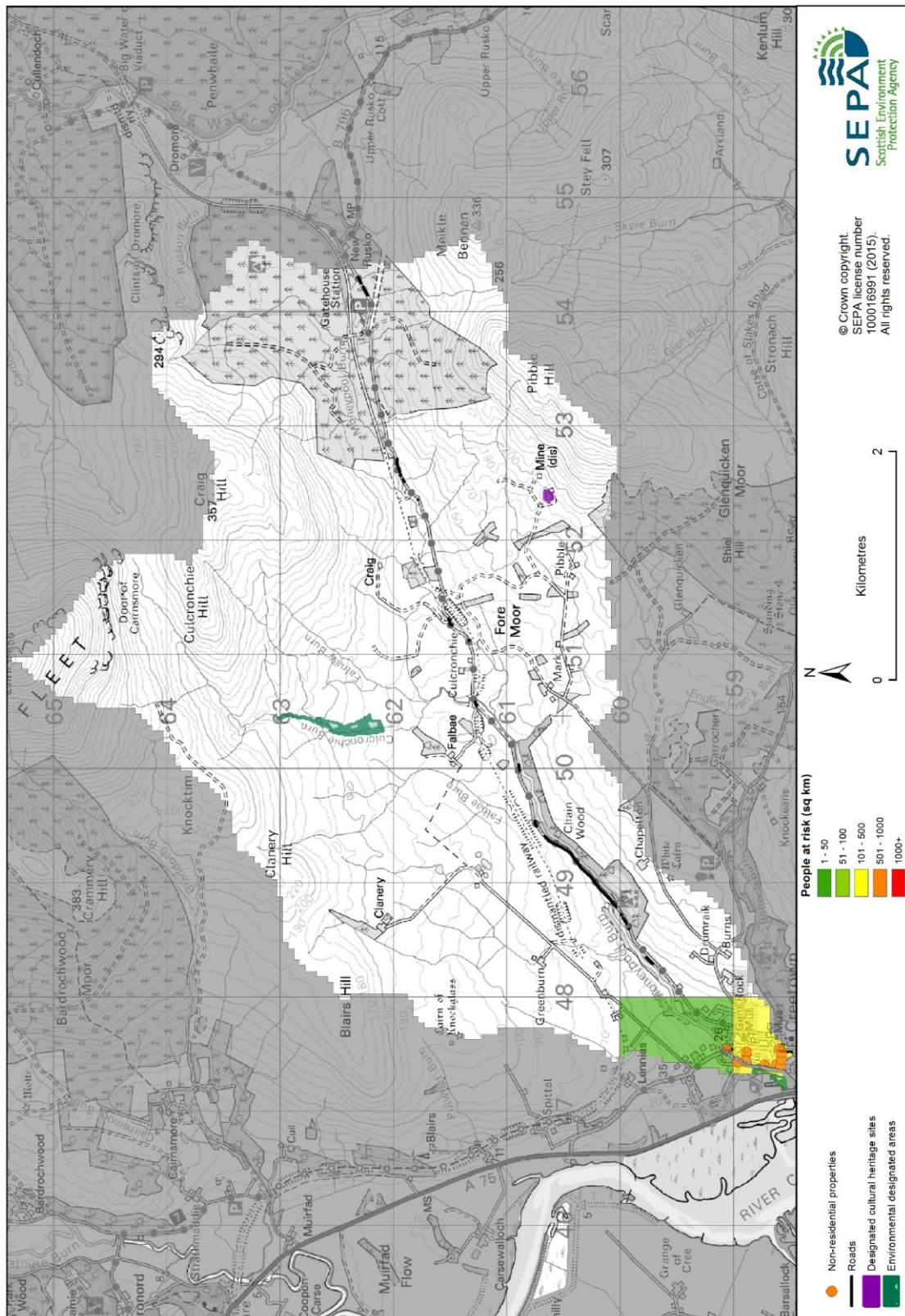
|   | 1 in 10<br>High likelihood | 1 in 200<br>Medium likelihood | 1 in 1000<br>Low likelihood |
|---|----------------------------|-------------------------------|-----------------------------|
| Residential properties (total 300)                | 50                         | 90                            | 120                         |
| Non-residential properties (total 30)             | <10                        | 20                            | 20                          |
| People  | 120                        | 200                           | 250                         |
| Community facilities                              | 0                          | 0                             | 0                           |
| Utilities assets                                  | 0                          | 0                             | 0                           |
| Transport links - roads (km)                      | 0.9                        | 1.2                           | 1.3                         |
| Environmental designated areas (km <sup>2</sup> ) | <0.1                       | <0.1                          | <0.1                        |
| Designated cultural heritage sites                | 1                          | 1                             | 1                           |
| Agricultural land (km <sup>2</sup> )              | 0.3                        | 0.4                           | 0.4                         |

**Table 1:** Summary of flood impacts<sup>1</sup>



**Figure 2:** Damages by flood likelihood

<sup>1</sup> Some receptors are counted more than once if flooded from multiple sources



**Figure 3: Impacts of flooding**

### History of flooding

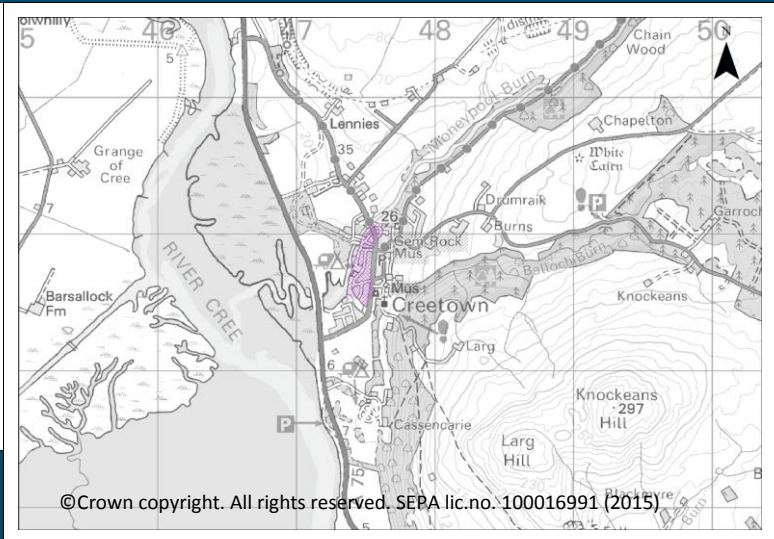
There has been little flooding reported within this area. However, coastal flooding did occur on 3 January 2014 and affected five properties. Flash flooding in Creetown occurred on July 2015 impacting properties.

## Objectives to manage flooding in Potentially Vulnerable Area 14/17

Objectives provide a common goal and shared ambition for managing floods. These objectives have been set by SEPA and agreed with flood risk management authorities following consultation. They were identified through an assessment of the underlying evidence of the causes and impacts of flooding. Target areas have been set to focus actions; they do not necessarily correspond to areas at risk in SEPA’s flood map. The objectives below have been set for Creetown Potentially Vulnerable Area.

### Reduce the risk of river and coastal flooding to residential properties in Creetown

- Indicators:
- 90 residential properties
  - £270,000 Annual Average Damages



Objective ID: 14023

| Target area                               | Objective   | ID    | Indicators within PVA  |
|---|---|-------|--|
| Applies across Solway Local Plan District | Avoid an overall increase in flood risk   | 14033 | <ul style="list-style-type: none"> <li>• 90 residential properties</li> <li>• £340,000 Annual Average Damages</li> </ul> |
| Applies across Solway Local Plan District | Reduce overall flood risk   | 14040 | <ul style="list-style-type: none"> <li>• 90 residential properties</li> <li>• £340,000 Annual Average Damages</li> </ul> |
| Applies across Solway Local Plan District | Organisations such as Scottish Water, energy companies and Historic Environment Scotland actively maintain and manage their own assets, including the risk of flooding. These actions are not detailed further in the Flood Risk Management Strategies. |       |  |

## Actions to manage flooding in Potentially Vulnerable Area 14/17

Actions describe where and how flood risk will be managed. These actions have been set by SEPA and agreed with flood risk management authorities following consultation. Selection of actions to deliver the agreed objectives was based on a detailed assessment and comparison of economic, social and environmental criteria. The actions shaded and then described below have been selected as the most appropriate for Creetown Potentially Vulnerable Area.

| Selected actions                     |                                       |                          |                                      |   |                              |
|--------------------------------------|---------------------------------------|--------------------------|--------------------------------------|---|------------------------------|
| <i>Flood protection scheme/works</i> | <i>Natural flood management works</i> | <i>New flood warning</i> | <i>Community flood action groups</i> | <i>Property level protection scheme</i> | <i>Site protection plans</i> |
| Flood protection study               | <i>Natural flood management study</i> | Maintain flood warning   | Awareness raising                    | <i>Surface water plan/study</i>         | Emergency plans/response     |
| Maintain flood protection scheme     | Strategic mapping and modelling       | Flood forecasting        | Self help                            | Maintenance                             | Planning policies            |

|                          |   |                      |                         |
|--------------------------|---|----------------------|-------------------------|
| <b>Action (ID):</b>      | <b>FLOOD PROTECTION STUDY (141220020)</b>   |                      |                         |
| <b>Objective (ID):</b>   | Reduce the risk of river and coastal flooding to residential properties in Creetown (14023)   |                      |                         |
| <b>Delivery lead:</b>    | Dumfries and Galloway Council   |                      |                         |
| <b>Priority:</b>         | National:   |                      | Within local authority: |
|                          | <b>1 of 168</b>   |                      | <b>1 of 10</b>          |
| <b>Status:</b>           | <b>Not started</b>  | Indicative delivery: | <b>2016-2021</b>        |
| <b>Description:</b>      | <p>A study is recommended to further develop the understanding of coastal flooding along the Solway coastline. This study should build on from the previous shoreline management plan to investigate flooding and coastal erosion, wave overtopping and the current coastal protection offered. The study may focus in detail on Potentially Vulnerable Areas however it could also look at the risk to other areas.</p> <p>The study will help to develop an understanding of coastal issues and identify where further work may be required to mitigate against flooding.</p> |                      |                         |
| <b>Potential impacts</b> |   |                      |                         |
| <b>Economic:</b>         | There are 259 residential properties and 64 non-residential properties at risk of flooding over the extent of this study. The potential damages avoided over this area are estimated to be up to £26.1 million.   |                      |                         |
| <b>Social:</b>           | A reduction in flood risk would have a positive benefit to the health and wellbeing of the community. Natural flood management actions can restore and enhance natural environments and create opportunities for recreation and tourism.  |                      |                         |

|                       |   |
|-----------------------|---|
| <b>Environmental:</b> | Flood protection studies should consider the positive and negative impacts of proposed actions on the ecological quality of the environment. To be in accord with the flood risk management strategy, the responsible authority should seek to ensure as part of the study that the Solway coastal study will not have an adverse effect on the integrity of the Loch of Inch and Torrs Warren Special Protection Area, Upper Solway Flats and Marshes Special Protection Area, Luce Bay and Sands Special Area of Conservation, and Solway Firth Special Area of Conservation. There is the potential for impacts on several coastal Sites of Special Scientific Interest. |
|-----------------------|---|

|                          |   |   |                  |
|--------------------------|---|---|------------------|
| <b>Action (ID):</b>      | <b>FLOOD PROTECTION STUDY (140230005)</b>   |   |                  |
| <b>Objective (ID):</b>   | Reduce the risk of river and coastal flooding to residential properties in Creetown (14023)   |   |                  |
| <b>Delivery lead:</b>    | Dumfries and Galloway Council   |   |                  |
| <b>Priority:</b>         | National:<br><b>96 of 168</b>   | Within local authority:<br><b>8 of 10</b> |                  |
| <b>Status:</b>           | <b>Not started</b>  | Indicative delivery:                      | <b>2016-2021</b> |
| <b>Description:</b>      | <p>A study is recommended to further investigate the feasibility of a flood protection scheme in Creetown. The study will focus on the benefit of flood defences on the Moneypool and Balloch Burns and the role of natural flood management actions for reducing runoff flow into the rivers. This study should take account of the interaction of the Moneypool and Balloch Burns with the tidal River Cree. Other actions may also be considered to select the most sustainable combination of actions.</p> <p>The Solway coastal study may also provide information which will feed into this study.</p>        |   |                  |
| <b>Potential impacts</b> |   |   |                  |
| <b>Economic:</b>         | The flood protection study should consider how to reduce flood risk to 82 residential properties and 15 non-residential properties in this location, with potential damages avoided of up to £3.4 million. The economic impact of natural flood management actions is difficult to define. However, these actions can reduce flood risk for high likelihood events. In this location, it has been estimated that 29 residential and non-residential properties could potentially benefit from natural flood management actions.   |   |                  |
| <b>Social:</b>           | A reduction in flood risk would have a positive benefit to the health and wellbeing of the community. Natural flood management actions can restore and enhance natural environments and create opportunities for recreation and tourism.  |   |                  |
| <b>Environmental:</b>    | Flood protection studies should consider the positive and negative impacts of proposed actions on the ecological quality of the environment. Natural flood management actions can have a positive impact by restoring and enhancing natural habitats. There are no international or national level environmental designations that are likely to be impacted by this action. Direct defences can, however, cause some or all of the floodplain to be disconnected from the river, which can lead to a reduction in water quality and a loss of carbon storage. There is the potential for local negative impacts on |   |                  |

|                       |   |
|-----------------------|---|
| <b>Environmental:</b> | morphology and sediment dynamics which in turn may impact fish through increased sediment load. |
|-----------------------|---|

|                        |  |                      |                  |
|------------------------|--|----------------------|------------------|
| <b>Action (ID):</b>    | <b>STRATEGIC MAPPING AND MODELLING (140400019)</b>   |                      |                  |
| <b>Objective (ID):</b> | Reduce overall flood risk (14040)  |                      |                  |
| <b>Delivery lead:</b>  | Scottish Water   |                      |                  |
| <b>Status:</b>         | <b>Not started</b>   | Indicative delivery: | <b>2016-2021</b> |
| <b>Description:</b>    | Scottish Water will carry out an assessment of flood risk within the highest risk sewer catchments to improve knowledge and understanding of surface water flood risk. |                      |                  |

|                        |   |                      |                |
|------------------------|---|----------------------|----------------|
| <b>Action (ID):</b>    | <b>MAINTAIN FLOOD WARNING (140400030)</b>   |                      |                |
| <b>Objective (ID):</b> | Reduce overall flood risk (14040)   |                      |                |
| <b>Delivery lead:</b>  | SEPA  |                      |                |
| <b>Status:</b>         | <b>Existing</b>   | Indicative delivery: | <b>Ongoing</b> |
| <b>Description:</b>    | Continue to maintain the Inner Wigtown Bay flood warning area which is part of the Solway coastal flood warning scheme. |                      |                |

|                        |  |                      |                |
|------------------------|--|----------------------|----------------|
| <b>Action (ID):</b>    | <b>FLOOD FORECASTING (140400009)</b>   |                      |                |
| <b>Objective (ID):</b> | Reduce overall flood risk (14040)  |                      |                |
| <b>Delivery lead:</b>  | SEPA   |                      |                |
| <b>Status:</b>         | <b>Existing</b>  | Indicative delivery: | <b>Ongoing</b> |
| <b>Description:</b>    | The Scottish Flood Forecasting Service is a joint initiative between SEPA and the Met Office that produces daily, national flood guidance statements which are issued to Category 1 and 2 Responders. The service also provides information which allows SEPA to issue flood warnings, giving people a better chance of reducing the impact of flooding on their home or business. For more information please visit SEPA's website. |                      |                |



|                        |  |                      |                |
|------------------------|--|----------------------|----------------|
| <b>Action (ID):</b>    | <b>SELF HELP (140400011)</b>   |                      |                |
| <b>Objective (ID):</b> | Reduce overall flood risk (14040)  |                      |                |
| <b>Delivery lead:</b>  | —  |                      |                |
| <b>Status:</b>         | <b>Existing</b>  | Indicative delivery: | <b>Ongoing</b> |
| <b>Description:</b>    | <p>Everyone is responsible for protecting themselves and their property from flooding. Property and business owners can take simple steps to reduce damage and disruption to their homes and businesses should flooding happen. This includes preparing a flood plan and flood kit, installing property level protection, signing up to Floodline and Resilient Communities initiatives, and ensuring that properties and businesses are insured against flood damage.</p> <p>Dumfries and Galloway Council has a Pilot Flood Product Subsidy Scheme in place, it is recommended that this should be continued. Residential or business properties that are identified as being at risk of flooding are eligible for the scheme. There are various products to reduce the impact of flooding to properties which can be purchased as part of the scheme.</p> |                      |                |

|                        |  |                      |                |
|------------------------|--|----------------------|----------------|
| <b>Action (ID):</b>    | <b>AWARENESS RAISING (140400013)</b>   |                      |                |
| <b>Objective (ID):</b> | Reduce overall flood risk (14040)  |                      |                |
| <b>Delivery lead:</b>  | Responsible authorities  |                      |                |
| <b>Status:</b>         | <b>Existing</b>  | Indicative delivery: | <b>Ongoing</b> |
| <b>Description:</b>    | <p>SEPA and the responsible authorities have a duty to raise public awareness of flood risk. Improved awareness of flood risk and actions that prepare individuals, homes and businesses for flooding can reduce the overall impact.</p> <p>SEPA will undertake flood risk education and awareness raising activities. In addition, SEPA will engage with community resilience groups and participate in property level protection events delivered by the Scottish Flood Forum where possible.</p> <p>Local authorities will be undertaking additional awareness raising activities. Further details will be set out in the Local FRM Plan.</p> |                      |                |

|                        |   |                      |                |
|------------------------|---|----------------------|----------------|
| <b>Action (ID):</b>    | <b>MAINTENANCE (140400007)</b>  |                      |                |
| <b>Objective (ID):</b> | Reduce overall flood risk (14040)   |                      |                |
| <b>Delivery lead:</b>  | Dumfries and Galloway Council, asset / land managers  |                      |                |
| <b>Status:</b>         | <b>Existing</b>   | Indicative delivery: | <b>Ongoing</b> |
| <b>Description:</b>    | Local authorities have a duty to assess watercourses and carry out clearance and repair works where such works would substantially reduce flood risk. They produce schedules of clearance and repair works and make these available for public inspection. Scottish Water undertake inspection and repair on the public sewer network. Asset owners and riparian landowners are responsible for the maintenance and management of their own assets including those which help to reduce flood risk. |                      |                |

|                        |   |                      |                |
|------------------------|---|----------------------|----------------|
| <b>Action (ID):</b>    | <b>EMERGENCY PLANS/RESPONSE (140400014)</b>   |                      |                |
| <b>Objective (ID):</b> | Reduce overall flood risk (14040)   |                      |                |
| <b>Delivery lead:</b>  | Category 1 and 2 Responders   |                      |                |
| <b>Status:</b>         | <b>Existing</b>   | Indicative delivery: | <b>Ongoing</b> |
| <b>Description:</b>    | <p>Providing an emergency response to flooding is the responsibility of many organisations, including local authorities, the emergency services and SEPA. Effective management of an emergency response relies on emergency plans that are prepared under the Civil Contingencies Act 2004 by Category 1 and 2 Responders. The emergency response by these organisations is co-ordinated through regional and local resilience partnerships. This response may be supported by the work of voluntary organisations.</p> <p>Dumfries and Galloway Council along with the Scottish Fire and Rescue Service, SEPA and the Scottish Flood Forum have procured a Flood Pod. The Pod can be deployed to an area at risk of a flood emergency and is filled with flood protection equipment which is issued to the public.</p> |                      |                |

|                        |  |                      |                |
|------------------------|--|----------------------|----------------|
| <b>Action (ID):</b>    | <b>PLANNING POLICIES (140330001)</b>   |                      |                |
| <b>Objective (ID):</b> | Avoid an overall increase in flood risk (14033)<br>Reduce overall flood risk (14040)   |                      |                |
| <b>Delivery lead:</b>  | Planning authority   |                      |                |
| <b>Status:</b>         | <b>Existing</b>  | Indicative delivery: | <b>Ongoing</b> |
| <b>Description:</b>    | Scottish Planning Policy and accompanying Planning Advice Notes set out Scottish Ministers' priorities for the operation of the planning system and for the development and use of land. In terms of flood risk management, the policy supports a catchment-scale approach to sustainable flood risk management and aims to build the resilience of our cities and towns, encourage sustainable land management in our rural areas, and to address the long-term vulnerability of parts of our coasts and islands. Under this approach, new development in areas with medium to high likelihood of flooding should be avoided. For further information on the application of national planning policies see Annex 2. |                      |                |